

USSN 10/626,488

PATENT

Amendment dated November 3, 2005

Reply to Office Action of July 12, 2005

Attorney Docket 713-54-PA

Amendments to the Claims:

The following listing of the claims replaces all previous listings and versions of the claims in the application:

Listing of the Claims:

1. (currently amended) A bottom tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:
 - a tubular conduit comprising a plurality of individual tubular riser pipes, the conduit being suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor; and,
 - a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:
 - a flexible jumper connecting the bottom end of the conduit to the well;
 - a weight applying a vertical tension in the conduit; and[.]]
 - means for a telescopic piling connected to the bottom end of the conduit by a pivot joint and slidably retained in a piling guide sunk into the sea floor, thereby constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform.
2. (canceled)
3. (previously presented) The riser system of claim 1, wherein the plurality of individual riser pipes are disposed within a single larger casing.
4. (original) The riser system of claim 3, further comprising a core pipe surrounded by the plurality of individual riser pipes.
5. (canceled)

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6. (currently amended) The riser system of claim [[5]] 1, wherein the weight is disposed on the conduit at the bottom end thereof.

7. (currently amended) The riser system of claim [[5]] 1, wherein the weight is disposed in the telescopic piling.

8. (original) The riser system of claim 1, wherein the vertical tension in the conduit is between about 1.05 to 1.2 times the weight of the conduit.

9. (currently amended) ~~The riser system of claim 1, wherein the constraining means comprises:~~
A bottom tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:

a tubular conduit comprising a plurality of individual tubular riser pipes, the conduit being suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor; and

a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:

a flexible jumper connecting the bottom end of the conduit to the well;

a weight applying a vertical tension in the conduit; and

constraining means for constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform;

wherein the constraining means comprises:

a plumb bar pivotally connected to the bottom end of the conduit and having a lower end with a base plate mounted thereon, the base plate containing a plurality of apertures; and[[;]]

a guide base disposed on the sea floor and having a plurality of upstanding guide posts, each guide post being slidably received in a corresponding one of the apertures in the base plate.

10. (currently amended) ~~The riser system of claim 1, wherein the constraining means comprises:~~

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A bottom tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:

a tubular conduit comprising a plurality of individual tubular riser pipes, the conduit being suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor; and

a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:

a flexible jumper connecting the bottom end of the conduit to the well;

a weight applying a vertical tension in the conduit; and

constraining means for constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform;

wherein the constraining means comprises:

the weight being connected to the bottom end of the conduit by a pivoting joint;

three guide rails attached to the sea floor; and[[],]]

three rigid arms, each having an upper end pivotally attached to the weight and a lower end pivotally attached to a respective shoe, and wherein each of the shoes is retained in a corresponding one of the guide rails for horizontal movement.

11. (original) The riser system of claim 1, wherein the jumper comprises steel or a flexible elastomer.

12. (original) The riser system of claim 1, wherein the jumper includes a radial bend, and wherein the bend has a radius of about 5 – 10 times the diameter of the conduit.

13. (currently amended) A bottom-tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:

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a tubular conduit suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor;

a flexible jumper connecting the bottom end of the conduit to the well; and

a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:

a weight connected to the bottom of the conduit and applying a vertical tension in the conduit; and

means for a telescopic piling connected to the bottom end of the conduit by a pivot joint and slidably retained in a piling guide sunk into the sea floor, thereby constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform.

14. (canceled)

15. (currently amended) The riser system of claim [[14]] 13, wherein the weight is disposed in the telescopic piling.

16. (previously presented) The riser system of claim 13, wherein the vertical tension in the conduit is between about 1.05 to 1.2 times the weight of the conduit.

17. (currently amended) ~~The riser system of claim 13, wherein the constraining means comprises:~~

A bottom-tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:

a tubular conduit suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor;

a flexible jumper connecting the bottom end of the conduit to the well; and

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a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:

a weight connected to the bottom of the conduit and applying a vertical tension in the conduit; and

means for constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform;

wherein the means for constraining comprises:

a plumb bar pivotally connected to the bottom end of the conduit and having a lower end with a base plate mounted thereon, the base plate containing a plurality of apertures; and

a guide base disposed on the sea floor and having a plurality of upstanding guide posts, each guide post being slidably received in a corresponding one of the apertures in the base plate.

18. (currently amended) ~~The riser system of claim 13, wherein the constraining means comprises:~~

A bottom-tensioned riser system for conveying petroleum from an offshore oil well on a sea floor to a platform floating above, the riser system comprising:

a tubular conduit suspended from the platform and having a bottom end extending downward therefrom in a substantially vertical direction and toward the sea floor;

a flexible jumper connecting the bottom end of the conduit to the well; and

a connection and tensioning assembly disposed at the bottom end of the conduit, the connection and tensioning assembly comprising:

a weight connected to the bottom of the conduit and applying a vertical tension in the conduit; and

means for constraining the bottom end of the conduit against horizontal movement, while enabling the conduit to move freely in a vertical direction and to pivot freely about the bottom end thereof in response to motions of the platform;

wherein the means for constraining comprises:

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a pivoting joint connecting the weight to the bottom end of the conduit;
a plurality of guide rails attached to the sea floor;
a shoe slidably received on each of the guide rails for horizontal movement thereon; and
a plurality of arms, each having an upper end pivotally attached to the weight and a lower
end pivotally attached to a respective shoe.